STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.	MO-0121525
Owner:	Opie's Transport, Inc.
Address:	P.O. Box 89, Eldon, MO 65026
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	Opie's Transport, Inc. WWTF
Facility Address:	Hwy 54 & Route FF, Eldon, MO 65026
Legal Description:	See page 2
Receiving Stream:	Unnamed Tributary to Branch Creek (U)
First Classified Stream and ID:	Brush Creek (C) (00995)
USGS Basin & Sub-watershed No.:	(10300102-210002)

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

Outfall #001 -

See page 2

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

June 1, 2001 — Effective Date

January 15, 2004 — (Revised)

Stephen M. Mahfood, Director, Department of Natural Resources
Executive Secretary, Clean Water Commission

May 31, 2006 — Expiration Date

R. Bruce Martin, Director, Southwest Regional Office

FACILITY DESCRIPTION (continued)

Outfall #001 – Industrial Wastewater – SIC #4213

Two cell lagoon / sludge is retained in lagoon / effluent pumped to Outfall #002.
Design population equivalent is 982.
Design flow is 36,840 gallons per day (1-in-10 year design including net rainfall minus evaporation).
Average design flow is 25,000 gallons per day (dry weather flows).
Design sludge production is 14.7 dry tons per year.

Legal Description: NW¼, NE¼, Sec. 25, T42N, R15W, Miller County

Outfall #002 – Storage basin and land application site.

Legal Description: NE¼, NE¼, Sec. 25, T42N, R15W, Miller County and SE¼, SE¼, Sec. 24, T42N, R15W, Miller County

Outfall #003 – Stormwater monitoring for land application site.

Legal Description: SE¼, SE¼, Sec. 24, T42N, R15W, Miller County

Outfall #004 – Stormwater monitoring for land application site.

Legal Description: NE¼, NE¼, Sec. 25, T42N, R15W, Miller County

FACILITY DESCRIPTION (continued)

Outfall #002 – Irrigation System Design

Receiving Stream Watershed: a gaining stream setting.

Facility Type: No-discharge Storage & Irrigation System for year round flows into lagoon.

Design Basis:	**Average Annual**
Design dry weather flows:	25,000 gpd
Design with 1-in-10 year flows:	36,842 gpd
Design PE: 982	

Storm Water Flows: (Miller County)

Average Annual Rainfall:	42.0	inches
1-in-10 Year Annual Rainfall:	52.0	inches

1-in-10 Year Flows:	Annual
Runoff from concrete and roof areas:	3.6 ft
Runoff from earth areas: (lagoon berm, lots, etc.)	2.5 ft
Rainfall minus evaporation (R-E) on lagoon water surface:	1.8 ft

Lagoon Dimensions:	**Surface Area**	**Depth from Bottom**	**Pump down depth (from spillway)**
Center Line Top Berm:	159,000 sq.ft.	by 19.0 feet depth	
Inside Top Berm:	150,450 sq.ft.	by 19.0 feet depth	
Emergency Spillway:	145,416 sq.ft.	by 18.0 feet depth	0.0 feet
Freeboard: (top berm to spillway):		1.0 feet depth	
Maximum operating level:		17.0 feet depth	1.0 feet
Minimum operating level:		14.0 feet depth	4.0 feet
Aerobic BOD design basis:		3.0 feet depth	

Storage volume (minimum to maximum water levels) 2,961,000 gallons

Berm top width: 10 feet Berm runoff area (Centerline to emergency spillway): 13,584 sq.ft.

1-in-10 year annual storm water flows into lagoon (R-E): 230,242 cu.ft. (1,722,800 gallons)

Storage Capacity:	**Average Annual**
Design for dry weather flows:	115 days
Design with 1-in-10 year flows:	80 days

Land Application:

Irrigation volume per year:	13,484,000 gallons (including 1-in-10 year flows)
Irrigation areas:	6.3 acres at design loading
Application rates per acre:	0.1 inch / hour; 2.0 inch / week; 78.8 inches / year
Field slopes:	less than 7 percent
Equipment type:	sprinklers / gated pipe
Vegetation:	grass land
Application rate is based on:	hydraulic loading rate

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #001 & 002 – Emergency discharge from lagoon, storage basin, or irrigation sites (Note 1)						
Flow	MGD	*		*	once/day**	24 hr. estimate
Biochemical Oxygen Demand$_5$	mg/L		65	45	once/week**	grab
Total Suspended Solids	mg/L		110	70	once/week**	grab
pH – Units	SU	***		***	once/week**	grab
Fecal Coliform	#/100mL	****		****	once/week**	grab
Nitrate / nitrite as N	mg/L	****		****	once/week**	grab
Ammonia Nitrogen as N	mg/L	****		****	once/week**	grab
Temperature (degrees)	C°	****		****	once/week**	grab
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE January 28, 2004.						
Outfall #002 – Land Application Operational Monitoring (Notes 2 & 3)						
Lagoon Freeboard	feet	*			once/month	measured
Irrigation Period	hours	*			daily	total
Volume Irrigated	gallons	*			daily	total
Application Area	acres	*			daily	total
Application Rate	inches / acre	*			daily	total
Rainfall	inches	*			daily	total
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE January 28, 2004. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM OTHER THAN TRACE AMOUNTS.						

B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Parts I STANDARD CONDITIONS DATED October 1, 1980, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #002 – Irrigated Wastewater (Note 4)						
Biochemical Oxygen Demand$_5$	mg/L	*			once/quarter*****	grab
Total Suspended Solids	mg/L	*			once/quarter*****	grab
pH – Units	SU	*			once/quarter*****	grab
Total Kjeldahl Nitrogen as N	mg/L	*			once/quarter*****	grab
Nitrate / Nitrite as N	mg/L	*			once/quarter*****	grab
Ammonia Nitrogen as N	mg/L	*			once/quarter*****	grab
Total Phosphorus as P	mg/L	*			once/quarter*****	grab
Total Sodium	mg/L	*			once/quarter*****	grab
Chlorides	mg/L	250			once/quarter*****	grab
Oil and Grease	mg/L	*			once/quarter*****	grab
Chemical Oxygen Demand	mg/L	*			once/quarter*****	grab
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE January 28, 2004. THERE SHALL BE NO DISCHARGE OF FLOATING OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Outfalls #003 & #004 – Storm Water Runoff (Note 5)						
Total Suspended Solids	mg/L	****			once/quarter******	grab
pH – Units	mg/L	****			once/quarter******	grab
Nitrate / Nitrite as N	SU	****			once/quarter******	grab
Ammonia Nitrogen as N	mg/L	****			once/quarter******	grab
Total Kjeldahl Nitrogen as N	mg/L	****			once/quarter******	grab
Chemical Oxygen Demand	mg/L	****			once/quarter******	grab
Temperature (degrees)	C°	****			once/quarter******	grab
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE January 28, 2004. THERE SHALL BE NO DISCHARGE OF FLOATING OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Parts I & III STANDARD CONDITIONS DATED October 1, 1980 and August 15, 1994, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #002 – Soil Monitoring at land application site (Notes 6 & 7)						
Nitrate / Nitrite as N	mg/kg	*			once/year	composite
Ammonia Nitrogen as N	mg/kg	*			once/year	composite
Oil and Grease	mg/kg	*			once/year	composite
Chlorides	mg/kg	*			once/year	composite
Available Phosphorous as P (Bray 1-P method)	mg/kg	*			once/3 years	composite
Total Sodium	mg/kg	*			once/3 years	composite
pH – Units	SU	(Range 6.0-7.5)			once/3 years	composite
Exchangeable Sodium Percentage	%	10			once/3 years	composite
Cation Exchange Capacity	CEC	*			once/3 years	composite
Organic Matter	%	*			once/3 years	composite

MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY; THE FIRST REPORT IS DUE January 28, 2004. THERE SHALL BE NO DISCHARGE OF FLOATING OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Parts I STANDARD CONDITIONS DATED October 1, 1980, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

* Monitoring requirement only.

** Monitor only when discharge occurs. Report as no-discharge when a discharge does not occur during the report period.

*** pH is measured in pH units and is not to be averaged. The pH is to be maintained at or above 6.0 pH units.

**** Comply with water quality standards per Special Conditions #5.

***** Sample once per quarter in the months of March, June, September, and December.

****** Sampling shall occur four times per year in the periods of January through March, April through June, July through September, and October through December, please note that monitoring reports shall be submitted no later than the 28th day of the month following the monitoring period (April 28th, July 28th, October 18th, and January 28th, respectively). For tracking purposes samples taken anytime in the first period (January through March) will be recorded by the department as though they were taken in March and samples taken anytime in the second period April through June) will be recorded by the department as though they were taken in June, etc.

Note 1 - No-discharge Facility requirements: Wastewater shall be stored and land applied during suitable conditions so that there is no-discharge form the lagoon or irrigation site. An emergency discharge may occur when excess wastewater has accumulated above feasible irrigation rates due to precipitation exceeding the 1-in-10 year 365 day rainfall or the 25-year-24-hour storm event.

Note 2 Records shall be maintained and summarized into an annual operating report, which shall be submitted by January 28th of each year for the previous calendar year. The report shall include the following:

a. Record of maintenance and repairs during the year, average number of times per month the facility is checked to see if it is operating properly, and description of any unusual operating conditions encountered during the year;

b. The number of days the lagoon has discharged during the year, the discharge flow, the reasons discharged occurred and effluent analysis performed; and

c. A summary of the irrigation operations including freeboard at the start and end of the irrigation season, the number of days of irrigation for each month, the total gallons irrigated, the total acres used, crops grown, crop yields per acre, the application rate in inches per acre per day and for the year, the monthly and annual precipitation received at the facility and summary of testing results.

Note 3 – Lagoon freeboard shall be reported as lagoon water level in feet below the overflow level. See Special Conditions for Wastewater Irrigation System requirements.

Note 4 – Wastewater that is irrigated shall be sampled at the irrigation pump or wet well.

Note 5 - Monitoring during the first hour after a discharge from a rainfall event greater than 0.2 inch in a 24 hour period. Stormwater runoff samples shall be collected for each storm water discharge point and the sample from each outfall shall be tested separately.

Note 6 - For nitrate testing, sample the top 0-24 inches of soil. For other parameters ample the top 0-6 inches of soil. Composite samples shall be collected from each land application site and each soil type in accordance with University of Missouri publications G9110, Sampling Your Soil for Testing. Testing shall conform to Soil Testing Procedures for North Central Region (North Dakota Agricultural Experiment Bulletin 499-Revised); Methods of Soil Analysis, American Society of Agronomy, Inc.; Soil Testing Plant Analysis, Soil Science Society of America Inc.; EPA Methods; or other methods approved by the department.

Note 7 – Report the results in the annual report that is submitted to the department on January 28 of each year.

C. SPECIAL CONDITIONS

1. Report as no-discharge when a discharge does not occur during the reporting period.

2. Outfalls must be marked in the field and on the topographic site map submitted with the permit application.

3. Permittee will cease discharge by connection to area wide wastewater treatment system within 180 days of notice of its availability.

4. Changes in Discharges of Toxic Substances

   The permittee shall notify the Director as soon as it knows or has reason to believe:

   (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"

      (1) One hundred micrograms per liter (100 µg/L);

      (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;

      (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;

      (4) The level established in Part A of the permit by the Director.

   (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.

5. Water Quality Standards

   (a) Discharges to waters of the state shall not cause a violation of water quality standards rule 10 CSR 20-7.031, including both specific and general criteria.

   (b) General Criteria. The following general water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:

      (1) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;

      (2) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;

      (3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;

      (4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;

      (5) There shall be no significant human health hazard from incidental contact with the water;

      (6) There shall be no acute toxicity to livestock or wildlife watering;

      (7) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;

      (8) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.

C. SPECIAL CONDITIONS (continued)

6. This permit may be reopened and modified, or alternatively revoked and reissued, to:

(a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:

(1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

(2) controls any pollutant not limited in the permit.

(b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.

(c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.

7. Sludge and Biosolids Use For Domestic Wastewater Treatment Facilities

(a) Permittee shall comply with the pollutant limitations, monitoring, reporting, and other requirements in accordance with the attached permit Standard Conditions.

(b) If sludge is not removed by a contract hauler, permittee is authorized to land apply biosolids that are removed from the domestic wastewater treatment lagoon during lagoon clean out and maintenance activities. Permit Standard Conditions, Part III shall apply to the land application of biosolids. Permittee shall notify the department at least 180 days prior to the planned removal of biosolids from the lagoon. The department may require submittal of a biosolids management plan for department review and approval as determined appropriate on a case-by-case basis.

8. Lagoons and earthen basins shall have a liner that is designed, constructed and maintained in accordance with 10 CSR 20-8.020(13)(A)4. If operating records indicate, excessive percolation, the department may require a water balance test in accordance with 10 CSR 20-8.020(16) or other investigations to evaluate adequacy of the lagoon seal. The department may require corrective action as necessary to eliminate excess leakage.

9. Wastewater Irrigation System (Outfall #002)

(a) Discharge Reporting. Any unauthorized discharge from the lagoon or irrigation system shall be reported to the department as soon as possible but always within 24 hours. Discharge is allowed only as described in the Facility Description and Effluent Limitations sections of this permit.

(b) Irrigation Design. Permittee shall operate the land application system in accordance with 10 CSR 20-8.020(15). Permittee shall operate the land application system in accordance with the design parameters listed in the Facility Description section of this permit:

(1) No-discharge System. When the Facility Description is "No-discharge", wastewater must be stored and irrigated at appropriate times. There shall be no-discharge from the irrigation site or storage lagoon except due to precipitation exceeding either the 1-in-10 year rainfall event for the design storage period or the 25-year-24-hour rainfall event.

C. SPECIAL CONDITIONS (continued)

9. Wastewater Irrigation System (Outfall #002) continued

(c) Lagoon Operating Levels – No-discharge Systems. The minimum and maximum operating water levels for the storage lagoon shall be clearly marked. Each lagoon shall be operated so that the maximum water elevation does not exceed one foot (1') below the overflow point except due to any exceedance of the 1-in-10 year or 25-year-24-hour rainfall events. Wastewater shall be land applied whenever feasible based on soil and weather conditions and permit requirements. Storage lagoon(s) shall be lowered to the minimum operating level prior to each winter by November 30th.

(d) Emergency Spillway. Lagoons and earthen storage basins should have an emergency spillway to protect the structural integrity of earthen structures during operation at near full water levels and in the event of overflow conditions. The spillway shall be at least one foot (1') below the top of berm. The department may waive the requirement for overflow structures on small existing basins.

(e) General Irrigation Requirements. The wastewater irrigation system shall be operated so as to provide uniform distribution of irrigated wastewater over the entire irrigation site. A complete ground cover of vegetation shall be maintained on the irrigation site unless the system is approved for row crop irrigation. Wastewater shall be land applied only during daylight hours. The wastewater irrigation system shall be capable of irrigating the annual design flow during an application period of less than 100 days or 800 hours per year.

(f) Land Application Site Locations. The permittee shall land apply only to suitable sites located within the overall property boundaries and descriptions listed in the permit application and approved Operation and Maintenance manual. Permittee requests for additional sites including non-owned property must follow permit modification procedures prior to land application. To request additional sites, the permittee should submit a revised application Form A and I, Mailing addresses for first down stream land owners of each site, topographic maps and other pertinent information for the proposed sites.

(g) Saturated / Frozen Conditions. There shall be no irrigation during frozen, snow covered, or saturated soil conditions. There shall be no irrigation on days when more than 0.2 inches of precipitation is received or when there is observation by operator of an imminent or impending rainfall event.

(h) Buffer Zones. There shall be no irrigation within 300 feet of any down gradient pond, lake, sinkhole, losing stream or water supply withdrawal; 100 feet of gaining streams or tributaries; 150 feet of dwellings; or 50 feet of the property line.

(i) Public Access Restrictions. Public access shall not be allowed to the irrigation site(s). Fencing and public access restrictions to land application sites shall be in accordance with requirements in 10 CSR 20-8.020(15)(B)(5).

(j) Equipment Checks During Irrigation. The irrigation system and application site shall be visually inspected at least once per hour during wastewater irrigation to check for equipment malfunctions and runoff from the irrigation site.

10. Nutrient Management

(a) Nitrogen. The permittee shall not exceed the plant available nitrogen management approach as listed in this permit.

(b) Phosphorus. When soil test phosphorus (P) levels are above 120 pounds per acres using Bray P-1 test method, the sludge application rate shall not exceed the annual crop requirements for available phosphorus in accordance with state NRCS guidelines. When state NRCS standards and guidelines become available, the permit will be revised to include the Phosphorus Threshold and Phosphorus Index methods to be developed under the USDA, NRCS National Policy, General Manual, Part 402.06.

(c) The actual application rates for a given year or growing season must be adjusted based on the approved management approach and the actual sludge and soil testing results and crop requirement. If crop yields are less than that predicted in the permit application, the application rates must be reduced or the yields increased through appropriate changes in management practice.

(d) This permit will be modified to require a Nutrient Management Plan (NMP) after promulgation of applicable state, EPA and USDA rules and guidelines. The NMP will replace the current PAN and phosphorus methods.

C. SPECIAL CONDITIONS (continued)

11. Plant Available Nitrogen (PAN) Procedure

(a) Wastewater, sludge and fertilizer nitrogen application shall not exceed the crop nitrogen requirements based on realistic crop yield goals and the Plant Available Nitrogen (PAN method. The wastewater application rate shall be calculated as follows:

PAN = CNR – CFN

WHERE: **CFN =** Commercial Fertilizer Nitrogen applied in pounds N/acre.
CNR = Crop Nitrogen Requirement in pounds N/acre.
PAN = Plant Available Nitrogen in wastewater and sludge expressed as annual pounds N/acres.
SRN = Soil Residual Nitrogen in pounds N/acre.

(b) Plant Available Nitrogen (PAN) is calculated as follows:

PAN = [Ammonia Nitrogen] x [Availability Factor]
+ [Organic Nitrogen] x [Availability Factor]
+ [Nitrate Nitrogen] x [Availability Factor]

For anaerobic treated wastewater and sludge, the nitrate nitrogen amounts will be negligible and can be ignored.

11. Plant Available Nitrogen (PAN) Procedure (continued)

(c) Plant Available Nitrogen (PAN) Availability factors are as follows:

(1) Average Availability factors for all fields:

Types of Nitrogen	**Surface Application**	**Immediate Incorporation or Subsurface Injection**
Organic	0.10 – 0.70*	0.10 – 0.70*
Ammonia	0.6**	0.9**
Nitrate	0.9**	0.9**

* Organic Nitrogen = [Total Kjeldahl Nitrogen as N] – [Ammonia as N]. Availability Factors based on time after application and waste type are:

Type of Wastewater And Sludge Treatment Method	Organic Nitrogen Availability Factor by Time Period Year 1	Year 2	Year 3	Cumulative Year 3+
Wastewater storage (aerobic or anaerobic)	0.40	0.20	0.10	0.70
Sludge storage (< 2 years storage time)	0.40	0.20	0.10	0.70
Lime Stabilized Sludge	0.40	0.20	0.10	0.70
Aerobic Sludge Digestor	0.30	0.15	0.08	0.53
Anaerobic Sludge Digestor	0.20	0.10	0.05	0.35
Sludge retained in wastewater treatment lagoon (35 lbs. BOD/acre loading and > 15 years sludge retention)	0.20	0.10	0.05	0.35
Composted Sludge (Class A)	0.10	0.05	0.03	0.18

NOTES: Year 1 is the current year of waste application; year 2 is the previous year of waste application; and year 3 is waste application two years ago. Nitrogen availability for years 1, 2 and 3 must be added when waste is applied in consecutive years. The cumulative factor is used when waste is applied at about the same rate for 3 consecutive years or longer.

C. SPECIAL CONDITIONS (continued)

11. Plant Available Nitrogen (PAN) Procedure (continued)

(c) Plant Available Nitrogen (PAN) Availability factors (continued)

(1) Average Availability factors for all fields (continued)

** Average inorganic nitrogen availability based on the typical soil and climate conditions when considering additions due to precipitation, dry deposition, and foliar absorption versus losses due to volatilization and denitrification (10% denitrification loss is included). The permittee may choose to use this average value for all fields or may adjust the N availability based on site specific soil conditions using the following tables under 'field Specific Availability Factors for Inorganic Nitrogen'.

(2) Field Specific Availability Factors for Inorganic Nitrogen.

For ammonia and nitrate nitrogen factors, the permittee may choose to use the average value for all fields under paragraph C.1. above, or may use the alternate factors on a field specific basis using the tables below. The approved factors for each field will be included in the O&M Manual.

Table A. Alternate Field Specific Availability Factors for Surface Application

% of inorganic N (manure., precip.) available

Soil Organic Matter %	Excessively Well drained	Well Drained	Moderately Well drained	Somewhat Poorly Drained	Poorly Drained
< 2	71	66	62	56	45
2-5	66	60	56	49	30
> 5	63	56	49	38	19

Adapted from USDA – NRCS, national Engineering Handbook, Part 651, Animal Waste Management Field Handbook (AWMFH), April 1992, Tables 11-6 and 11-8.

Table B. Alternate Field Specific Availability Factors for Sub-Surface Injection or Immediate Incorporation.

% of inorganic N (manure., precip.) available

Soil Organic Matter %	Excessively Well drained	Well Drained	Moderately Well drained	Somewhat Poorly Drained	Poorly Drained
< 2	89	84	78	70	57
2-5	84	76	70	62	38
> 5	80	70	62	48	24

Adapted from USDA – NRCS, national Engineering Handbook, Part 651, Animal Waste Management Field Handbook (AWMFH), April 1992, Tables 11-6 and 11-8.

C. SPECIAL CONDITIONS (continued)

11. Plant Available Nitrogen (PAN) Procedure (continued)

(d) Soil Residual Nitrogen (SRN).

(1) For Annual Crops, the nitrogen availability from soil organic matter must be included based on soil CEC and crop season as follows:

SRN in pound N/acre* = [percent organic matter] x Soil Availability Factor

Soil Availability Factor
By Soil CEC Ranges and Organic Matter

Growing Season	Organic Matter	CEC <10	CEC 10-18	CEC >18
Summer	**1%**	**40***	**20**	**10**
Winter	**1%**	**20***	**10**	**5**

***Note:** If CEC is less than 10 and organic matter is 1.5% or greater, the total SRN is constant at 60 pound nitrogen for summer and 30 pounds for winter.

(2) For Perennial Crops the SRN is considered zero (0) for purposes of these calculations because the SRN has already been considered in the crop fertilization recommendations in the referenced publications.

(e) Crop nitrogen requirements shall be based on University of Missouri publication, Soil Test Interpretations and Recommendations Handbook, as revised or one of the other reference publications listed in this permit. Alternate reference publications may be used only upon prior approval by the department and shall be listed in the approved Operation and Maintenance Manual.

(f) If a crop is not harvested, the PAN rate shall not exceed 40 lbs/acre/year and grass vegetation must be maintained on the site.

(g) PAN calculations, application amounts, crop yields and crop removal rates shall be listed in the annual report.

(h) Conversion Factors for laboratory testing results:

[mg/L or mg/kg or ppm] x [conversion factor] = [pounds per Unit Volume]

Unit Volume	Conversion Factors
1 lbs/acre inch	0.226
1 lbs/1,000 gallons	0.0083
1 lbs/100 cubic feet	0.0062
1lbs/ton (wet wt)	0.002

(i) Alternate nitrogen availability factors may be considered based upon site-specific conditions for each filed and submittal of scientific justification. Alternate factors will be reviewed and approved by the department as part of the Operation and Maintenance Manual.

(j) Supplemental nitrogen may be added to row crops when determined necessary for proper plant growth based on testing of plant vegetation or soil nitrate testing during the growing season. Procedures will be reviewed and approved by the department as part of the Operation and Maintenance Manual.

(k) Primary reference publications used herein are:

(1) Livestock Waste Facilities Handbook, Midwest Plan Service, MWPS-18, April 1993.

(2) National Engineering Handbook, Part 651, Agricultural Waste Management Field Book, USDA, Natural Resources Conservation Service (NRCS), April 1992 and current supplements.

(3) Managing Nitrogen for Groundwater Quality and Farm Profitability, Soil Science Society of America, Inc. 1991

C. SPECIAL CONDITIONS (continued)

11. Plant Available Nitrogen (PAN) Procedure (continued)

(k) Primary reference publications used herein are (continued)

(4) Soil Test Interpretations and Recommendations Handbook, University of Missouri, Department of Agronomy, December 1992.

(5) Land Application of Sewage Sludge, EPA/831-B-002b, U.S. Environmental Protection Agency, December, 1994

12. Annual Report (Outfall #002)

An annual report is required in addition to the quarterly reporting under Section A of this permit. The annual report shall be submitted by January 28 of each year for the previous growing season from October 1 through September 30 or an alternated 12 month period approved by the Department and listed in the Operation and Maintenance Manual. This report shall be submitted using report forms approved by the Department and shall include a summary of the monitoring and record keeping required by the Special Conditions and Standard Conditions of this permit. The report shall include the following:

(a) Record of maintenance and repairs performed during the year, average number of times per month the facility is checked to see if it is operating properly, and description of any unusual operating conditions encountered during the year;

(b) The number of days the lagoon has discharged during the year, the discharge flow, the reasons discharge occurred and effluent analysis performed; and

(c) A summary of the irrigation operations including freeboard at the start and end of the irrigation season, the number of days of irrigation for each month, the total gallons irrigated, the total acres used, crops grown, crop yields per acre, the application rate in inches/acre per day and for the year, the monthly and annual precipitation received at the facility and summary of testing results.

(d) Narrative summary of any problem or deficiencies identified, permit violations, corrective action taken and improvements planned. Include such items as over application of sludge or nutrients, lower crop yields than predicted, spills, runoff during land application, citizen complaints, odors, nuisance conditions, improper field storage, improper spreading practices, failure to follow buffer zones, etc.

13. Operation and Maintenance Manual (Outfall #002)

The permittee shall develop, maintain and implement an Operation and Maintenance (O&M) Manual that includes all necessary items to ensure the operation and integrity of the waste handling and land application systems. Copies of the O&M Manual and subsequent revisions shall be submitted to the departments Water Pollution Control Program and Regional Office for review and approval. The O&M Manual shall include, but not limited to, the following:

(a) Detailed topographic maps of the property showing al land application fields including the identification numbers for each field and tract. For spray irrigation systems, each irrigation run shall also be shown. Each field, tract and irrigation run shall have an identification number for record keeping and tracking purposes. The maps shall also indicate separation distances from streams, ponds, wells, and property lines and shall indicate areas exceeding 10 percent slopes and other area that are not suitable for land application. The maps shall also included the location of all buildings, pump stations, earthen storage basins, storage structures, containment structures, irrigation pipelines, irrigation riser connections, underground terrace outlets, composting areas, dead animal storage or disposal areas, domestic wastewater treatment systems and other waste handling units.

(b) Start up procedures, field supervision during operation, and shutdown procedures of irrigation equipment.

(c) Procedures for providing the separation distances required by this permit and as specified in 10 CSR 20-8.020 (15)(B).

(d) Sample collection, preservation, and testing procedures.

(e) Procedures for determining Plant Available Nitrogen (PAN) loading rates.

C. SPECIAL CONDITIONS (continued)

13. Operation and Maintenance Manual (Outfall #002) (continued)

(f) Record keeping forms for tracking each field, tract and storage structure. This shall include testing results, crops, yields, and application rates for each field. Records for each field and tract shall include dates and amounts applied.

(g) A Procedure for promptly reporting spills or discharges to the permittee plant manger and to DNR.

(h) A procedure for recording repair work on gravity sewer lines, recycle lines, and irrigation lines to include the reason for the repair work and the material used for the repair.

(i) A program to eliminate debris and blockages of sewer lines and recycle lines and to keep debris out of storage structures.

(j) A procedure for routine visual inspections of the storage and irrigation system for overflows or other operational problems.

(k) A program for routine, unannounced inspections of land application sites and records to ensure that all directives for land application from the permittee, central office are being followed. Records of the inspections shall be maintained by the permittee and made available to the department upon request.

(l) A procedure to assure that all appropriate employees are properly trained in operation of the waste systems and are familiar with the O&M Manual

(m) Procedure for adjusting application periods and rates based on soil infiltration capacity, soil moisture content, and percent of soil field (saturation) capacity.

(n) List of number, size, and capacity of waste removal, hauling and land application will occur based on equipment and personnel available.

(o) Number of suitable days each year when land application will occur based on historical one in ten year wettest precipitation and capacity of spreading equipment and personnel available.

(p) Procedure to avoid application if there is a weather forecast for significant precipitation within 24 hours.

(q) Nutrient Management Plan.